



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,719	03/19/2004	Thomas D. Barber	20.2903	2718
23718	7590	10/31/2006	EXAMINER	
SCHLUMBERGER OILFIELD SERVICES 200 GILLINGHAM LANE MD 200-9 SUGAR LAND, TX 77478			SHARON, AYAL I	
			ART UNIT	PAPER NUMBER
			2123	

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/708,719	BARBER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 19 March 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-21 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-21 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 1/31/2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 3/19/04, 7/7/05.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Introduction***

1. Claims 1-21 of U.S. Application 10/708,719 filed on 03/19/2004 are currently pending.

### ***Claim Objections***

2. Claims 17-21 are objected to because of the following informalities: they are system claims that depend from method claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country; more than one year prior to the date of application for patent in the United States.

4. The prior art used for these rejections is as follows:
5. Semmelbeck et al., U.S. Patent 5,663,499. (Hereinafter “**Semmelbeck**”).
6. The claim rejections are hereby summarized for Applicant’s convenience. The detailed rejections follow.

**7. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Semmelbeck.**

8. In regards to Claim 1, Semmelbeck teaches the following limitations:

*1. A method for modeling borehole effects of an induction tool having a plurality of arrays that include at least one transverse array, the method comprising:*

*selecting a formation-borehole model having a set of parameters, wherein the set of parameters comprises a direction of tool eccentering;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*determining initial values for the set of parameters;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*computing expected responses for a selected set of arrays from the plurality of arrays of the induction tool, wherein the computing is based on the formation-borehole model;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*comparing the expected responses with actual responses for the selected set of arrays;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*adjusting values of the set of parameters, if a difference between the expected responses and the actual responses is no less than a predetermined criterion;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*repeating the computing, the comparing, and the adjusting, until the difference between the expected responses and the actual responses is less than the predetermined criterion;*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

*determining the borehole effects from final values of the set of parameters.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

9. In regards to Claim 2, Semmelbeck teaches the following limitations:

*2. The method of claim 1, wherein the set of parameters further comprises a vertical formation conductivity and a horizontal formation conductivity.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

10. In regards to Claim 3, Semmelbeck teaches the following limitations:

*3. The method of claim 2, wherein the set of parameter further comprises mud resistivity, a borehole diameter, and a tool standoff.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

11. In regards to Claim 4, Semmelbeck teaches the following limitations:

*4. The method of claim 1, wherein the initial values for the set of parameters comprise at least one value determined from borehole logging data.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

12. In regards to Claim 5, Semmelbeck teaches the following limitations:

*5. The method of claim 4, wherein the at least one value is selected from mud resistivity and a borehole diameter.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

13. In regards to Claim 6, Semmelbeck teaches the following limitations:

*6. The method of claim 5, wherein the mud resistivity is determined by a mud resistivity sensor and the borehole diameter is determined by a caliper.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

14. In regards to Claim 7, Semmelbeck teaches the following limitations:

*7. The method of claim 1, wherein the comparing comprises using a penalty function.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

15. In regards to Claim 8, Semmelbeck teaches the following limitations:

*8. The method of claim 7, wherein the penalty function is based on squares of differences between the expected responses and the actual responses.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

16. In regards to Claim 9, Semmelbeck teaches the following limitations:

*9. The method of claim 1, further comprising correcting measurements of the plurality of arrays using the determined borehole effects.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

17. In regards to Claim 10, Semmelbeck teaches the following limitations:

*10. The method of claim 1, wherein the induction tool comprises at least one triaxial array.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

18. In regards to Claim 11, Semmelbeck teaches the following limitations:

*11. The method of claim 10, wherein the initial values for the set of parameters comprises the direction of tool eccentering determined from data obtained with the at least one triaxial array.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

19. In regards to Claim 12, Semmelbeck teaches the following limitations:

*12. The method of claim 11, wherein the direction of eccentering is determined from off-diagonal elements of an apparent conductivity matrix.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

20. In regards to Claim 13, Semmelbeck teaches the following limitations:

*13. The method of claim 12, wherein the apparent conductivity matrix is rotated to produce a simplified matrix of apparent conductivities.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

21. In regards to Claim 14, Semmelbeck teaches the following limitations:

*14. The method of claim 13, wherein borehole corrections are applied to the simplified matrix of apparent conductivities to produce a corrected matrix of apparent conductivities.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

22. In regards to Claim 15, Semmelbeck teaches the following limitations:

*15. The method of claim 14, further comprising rotating the corrected matrix of apparent conductivities to correspond to an original tool orientation.*

(See especially, Semmelbeck: Abstract; col.1; line 40 to col.2, line 11; col.2, line 57 to col.3, line 3)

**23. Claims 16-21 are rejected based on the same reasoning as claims 1-3 and**

**7-9. Claims 16-21 are system claims that recite limitations equivalent to**

**those recited in method claims 1-3 and 7-9 and taught throughout  
Semmelbeck.**

***Conclusion***

24. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.
25. U.S. Patent 6,820,702 to Niedermayer et al. (See Fig.15, Items 1010 and 1020; and col.26, lines 41-61).
26. U.S. Patent 5,115,871 to McCann et al. (col.2, lines 33-58).

***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a bi-week, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753.

Any response to this office action should be faxed to (571) 273-8300, or mailed to:

USPTO  
P.O. Box 1450  
Alexandria, VA 22313-1450

or hand carried to:

USPTO  
Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application  
or proceeding should be directed to the Tech Center 2100 Receptionist, whose  
telephone number is (571) 272-2100.

Ayal I. Sharon  
Art Unit 2123  
October 24, 2006



10/27/06

PAUL RODRIGUEZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100